## Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application:

## Listing of Claims:

Claims 1-8 (Cancelled).

- 9(Original). A method for detection of differential expression of natural antisense messenger RNA (mRNA), comprising:
- (a) separately obtaining polyA-mRNA-A molecules from cell population A and polyA-mRNA-B molecules from cell population B;
- (b) separately generating by a reverse transcription enzyme a population of single-stranded cDNA-A molecules from polyA-mRNA-A and a population of single-stranded cDNA-B molecules from polyA-mRNA-B, wherein the polydeoxythymidine containing oligonucleotide primer used to produce the cDNA-B molecules comprises a specific bacteriophage RNA polymerase promoter region close to its 5' terminus;
- (c) incubating the combined populations of singlestranded cDNA-A molecules and single-stranded cDNA-B molecules,
  under conditions allowing hybridization of sense cDNA molecules
  with antisense cDNA molecules, wherein each single-stranded
  antisense cDNA molecule that hybridizes has a segment
  complementary to the sense DNA molecule and hybridizes thereto to
  form a hybrid molecule with a double-stranded segment;

- (d) treating the hybrid molecules with a DNA polymerase having a 5' to 3' polymerase activity and a 3' to 5' exonuclease activity to remove single-stranded non-hybridized segments of the hybrid molecule from 3' to 5' and to extend the double-stranded segment of the hybrid molecule 5' to 3' over an adjacent single-stranded segment as template, thereby forming a double-stranded molecule having the RNA polymerase promoter region close to one terminus;
- (e) using the double-stranded molecule as a template for the specific RNA polymerase to produce a population of RNA molecules;
- (f) labeling with a first label the RNA molecules
  produced in step (e);
- (g) labeling with a second label as control the polyA-mRNA-A molecules and/or the polyA-mRNA-B molecules of step (a);
- (h) mixing labeled RNA molecules from steps (f) and (g) and hybridizing them to a DNA microarray; and
- (i) identifying the genes on the microarray which are preferentially labeled with the labeled RNA molecules of step (f).
- 10 (Currently amended). The method according to claim [[10]] 9, wherein the specifc bacteriophage polymerase is selected from the group consisting of T7 RNA polymerase, T3 RNA polymerase, and SP6 RNA polymerase.

11 (Currently amended). The method according to claim [[10]]  $\underline{9}$ , wherein following step (b) the cDNA-B is modified in order to resist the 3' to 5' exonuclease activity of step (d).

12 (Currently amended). The method according to claim [[12]]  $\underline{11}$ , wherein in step (d) the 3' terminus of the cDNA-B is modified.

13 (Currently amended). The method according to claim [[12]] 11, wherein in step (d) the entire cDNA-B is modified.

14 (Currently amended). The method according to claim [[13]] 12, wherein 3' terminus of the cDNA-B is modified by addition of a nucleotide analog.

15 (Currently amended). The method according to claim [[14]]  $\underline{13}$ , wherein the entire cDNA-B is modified by incorporation of nucleotide analogs.

16 (Currently amended). The method according to claim [[10]]  $\underline{9}$ , wherein the first label of step (f) is Cy3, and the second label of step (g) is Cy5.

17 (Currently amended). The method according to claim [[10]] 9, wherein the first label of step (f) is Cy5, and the second label of step (g) is Cy3.

18 (Original). A method for detection of differential expression of natural antisense messenger RNA (mRNA), comprising:

- (a) separately obtaining polyA-mRNA-A molecules from cell population A and polyA-mRNA-B molecules from cell population B;
- (b) separately generating by a reverse transcription enzyme a population of single-stranded cDNA-A molecules from polyA-mRNA-A and a population of single-stranded cDNA-B molecules from polyA-mRNA-B, wherein the polydeoxythymidine containing oligonucleotide primer used to produce the cDNA-A molecules comprises close to its 5' terminus a sequence identical to an amplification primer used in step (e) and wherein the polydeoxythymidine containing oligonucleotide primer used to produce the cDNA-B molecules comprises a specific bacteriophage RNA polymerase promoter region close to its 5' terminus;
- (c) incubating the combined populations of singlestranded cDNA-A molecules and single-stranded cDNA-B molecules,
  under conditions allowing hybridization of sense cDNA molecules
  with antisense cDNA molecules, wherein each single-stranded
  antisense cDNA molecule that hybridizes has a segment
  complementary to the sense DNA molecule and hybridizes thereto to
  form a hybrid molecule with a double-stranded segment;
- (d) treating the hybrid molecules with a DNA polymerase having a 5' to 3' polymerase activity and a 3' to 5' exonuclease activity to remove single-stranded non-hybridized segments of the hybrid molecule from 3' to 5' and to extend the double-

stranded segment of the hybrid molecule 5' to 3' over an adjacent single-stranded segment as template, thereby forming a double-stranded molecule having the RNA polymerase promoter region close to one terminus;

- (e) amplifying the double-stranded molecule of step (d) using a thermostable polymerase and a first amplification primer identical to the sequence used in step (b) and a second amplification primer identical to the specific bacteriophage RNA polymerase promoter region of step (b);
- (f) using the double-stranded molecules so produced as a template for the specific RNA polymerase to produce a population of RNA molecules;
- (g) labeling with a first label the RNA molecules
  produced in step (f);
- (h) labeling with a second label as control the polyA-mRNA-A molecules and/or the polyA-mRNA-B molecules of step (a);
- (i) mixing labeled RNA molecules from steps (g) and (h) and hybridizing them to a DNA microarray; and
- (i) identifying the genes on the microarray which are preferentially labeled with the labeled RNA molecules of step(g).
- 19 (Currently amended). The method according to claim [[19]] 18, wherein the specifc bacteriophage polymerase is

selected from the group consisting of T7 RNA polymerase, T3 RNA polymerase, and SP6 RNA polymerase.

20 (Currently amended). The method according to claim [[19]]  $\underline{18}$ , wherein following step (b) the cDNA-B is modified in order to resist the 3' to 5' exonuclease activity of step (d).

21 (Currently amended). The method according to claim [[21]]  $\underline{20}$ , wherein in step (d) the 3' terminus of the cDNA-B is modified.

22 (Currently amended). The method according to claim [[21]] 20, wherein in step (d) the entire cDNA-B is modified.

23 (Currently amended). The method according to claim [[22]] 21, wherein 3' terminus of the cDNA-B is modified by addition of a nucleotide analog.

24 (Currently amended). The method according to claim [[23]] 22, wherein the entire cDNA-B is modified by incorporation of nucleotide analogs.

25 (Currently amended). The method according to claim [[19]]  $\underline{18}$ , wherein the first label of step (g) is Cy3, and the second label of step (h) is Cy5.

26 (Currently amended). The method according to claim [[10]]  $\underline{9}$ , wherein the first label of step (g) is Cy5, and the second label of step (h) is Cy3.